VII Semester Syllabi – Computer Science & Engineering

B.Tech. CSE 2016 Batch Sem-VII [July-Dec2019]						
Sr. No.	**Course Code**	**Course Name**	**L**	**T**	**P**	**Credits**
1	CS3ELXX	Elective-6	3	0	0	3
2	OE000XX	Open Elective-2	3	0	0	3
3	OE000XX	Open Elective-3	3	0	0	3
4	EN3HS04	Fundamentals of Management, Economics & Accountancy	3	0	0	3
5	CS3PC01	Project Work I	0	0	8	4
6	CS3PC03	Industrial Training	2	0	0	2
		Total	14	0	8	18
		Total Contact Hours	22			

CS3EL08 - Programming with XML
CS3EA03 Soft Computing
CS3ED04 Big Data Engineering
OE00018 Python Essentials
OE00051 R Programming
OE00056 Cloud Security
OE00015 Agile Development
OE00016 Block Chain Architecture

Course Code	Course Name	Hours per Week			Total
		L	T	P	Credits
CS3EL08	Programming with XML	3	0	0	3

UNIT I Introduction to XML

XML overview, Markup languages, Comparison with HTML, Usage, Rules for writing XML, XML syntax, Creating notebook XML, Tree structure of XML, Elements, Attributes and values, Root element, Child element, Nesting of elements, Empty elements, Adding attributes, Elements and Attributes uses, Writing comments, Predefined entities, XML tools, XML validation.

UNIT II XML-DTDs (Document Type Definitions)

Document Type Definition, DTD syntax, Creating a DTD for notebook XML, Defining elements with children, Empty element, Number of occurrences, Defining choices, Attribute definitions, Internal and external DTD's, Validating XML with DTD, Pros and cons of using DTD.

UNIT III XML-Schema

Introduction to Schema, Namespace, Schema definition, Data types, Simple and complex data types, Attributes definition, Restrictions on values, Creating schema definition for notebook XML, Link and Validate XML with schema.

UNIT IV XSLT

Introduction to XSL, Layout of an XSL Document and Templates, Linking XSL to your XML Source, Transforming XML with XSLT, xsl:output, xsl:template, xsl:apply-templates, Looping over nodes using xsl:for-each, Apply conditions using xsl:if, Processing and output using xsl:value-of, Sorting nodes, Create a XSLT for notebook and XML file and generate output in different conditions.

UNIT V XPath and Project

Introduction to XPath, Using XPath to navigate an XML document, Predicates.

Sample Project: Store the information of students in XML file, validate it using XML schema and display the information of students in HTML using XSLT with proper formatting and conditions like having enrollment number, name start with, having CGPA between, in sorted order, etc.

Text Books:

1. Introduction to XML V.1, O'Reilly Publication.
2. Deitel H.M., XML How to Program, Pearson Publication.
3. Uttam K. Roy, Web Technologies, Oxford University Press.

Reference Books:

1. Michael J. Young, XML Step by Step, Microsoft Press; 2nd edition
2. Elliotte Rusty Harold, XML Bible Second Edition, Hungry Minds Publication.

Course Code	Course Name	Hours per Week			Total Credits
		L	T	P	
CS3ED04	Big Data Engineering	3	0	0	3

UNIT I Foundations of Big Data Systems
Introduction to Big Data and its Applications Data Abstraction Linear data structures like Hashtables, Hashmaps, Bloom Filters Non-linear data structures like Binary Search Trees, KD Trees Distributed Algorithm Design Algorithm Design using MapReduce

UNIT II Platforms for Big Data
Distributed Computing Environment for Big Data: NoSQL databases for Big Data Storage Applications (HBase) Distributed Processing of data using MapReduce & Pig In-memory distributed processing using Apache Spark Data Storage on Cloud (Amazon S3 & Dynamo DB)

UNIT III Processing Big Data – ETL & Batch Processing
Performing ETL Operations Concepts in Data Warehousing and its relevance for Big Data Ingesting data into Big Data Platforms using Sqoop & Flume Workflow management for Hadoop using OOZIE Batch Processing on Cloud

UNIT IV Processing of Real Time Data & Streaming Data
Applications of Streaming Data in Industry Sourcing Streaming data using Apache Flume Building real-time data pipelines using Apache Storm Streaming on Apache Spark

UNIT V Big Data Analytics
Regression, Clustering & Classification using Spark MLLib Building visualizations using Big Data Case Studies on applications of Big Data Analytics

Text Books:

1. Mayank Bhushan. Big Data and Hadoop- Learn by Example, BPB Publications
2. Erl/Khattak/Buhler. Big Data Fundamentals: Concepts Drivers and Techniques. Prentince Hall

Reference Books:

1. Jeffrey Aven , Hadoop in 24 Hours, Sams Teach Yourself, SAMS Publications.
2. DT Editorial Services, Big Data, Black Book: Covers Hadoop 2, MapReduce, Hive, YARN, Pig, R and Data Visualization, Dream Tech Publications

Course Code	Course Name	Hours per Week			Total Credits
		L	T	P	
OE00051	R Programming	3	0	0	3

UNIT I R Basics
Introduction: Basic features of R, advantages of using R, Limitations, R resources, Arithmetic and objects, Math, Variables, and Strings, Vectors and Factors, Vector operations.

UNIT II Data Structures in R
Data types, Arrays, Tables, Matrices: operations, Lists: operations, Data frames: creation, factors, reading.

UNIT III R Programming Fundamentals
Conditions and loops, Functions in R, Objects and Classes, Recursion, Debugging

UNIT IV Working with data in R
Reading CSV and Excel Files, Reading text files, Writing and saving data objects to file in R, Reading in larger, Datasets, Exporting data. Interface to outside world.

UNIT V String & Dates in R, Graphics
String operations in R, Regular Expressions, Dates in R, Time in R, Graphics: one-dimension plot, legends, function plot, box plot.

Text Books:

1. Andrie de Vries, Joris Meys, R Programming For Dummies, Wiley Publications.
2. Roger D. Peng, R Programming for Data Science, Leanpub.

Reference Books:

1. Emmanuel Paradis, R For Beginners, CRAN Publications.
2. Michael J. Crawley, The R Book, Wiley Publications.

Course Code	Course Name	Hours per Week			Total
		L	T	P	Credits
OE00056	Cloud Security	3	0	0	3

UNIT I Security Concepts
Confidentiality, privacy, integrity, authentication, non-repudiation, availability, access control, defense in depth, least privilege, how these concepts apply in the cloud, what these concepts mean and their importance in PaaS, IaaS and SaaS,e.g. User authentication in the cloud; Cryptographic Systems- Symmetric cryptography, stream ciphers, block ciphers, modes of operation, public-key cryptography, hashing, digital signatures.

UNIT II Security Fundamentals and Risk Issues in the Cloud
Cloud Information Security Objectives, Cloud Security services, Cloud Security Design Principles, Secure Cloud Software Requirements, Security Policy Implementation and decomposition, Cloud Computing and Business Continuity/Disaster Recovery, CIA triad, Privacy and compliance risk. Infrastructure Security: Infrastructure Security: The Network Level, Infrastructure Security: The Host Level, Infrastructure Security: The Application Level. Data Security and Storage: Aspects of Data Security, Data Security Mitigation, Provider Data and Its Security.

UNIT III Identity and Access Management
Introduction, Definitions, Trust Boundaries, Challenges, Architecture and Practices, Getting Ready for the Cloud, Relevant IAM Standards and Protocols for Cloud Services, Cloud Authorization Management, Cloud Service Provider IAM Practice.

UNIT IV Security Management in the Cloud
Security Management Standards, Security Management, Availability Management, SaaS Availability Management, PaaS Availability Management, IaaS Availability Management, Access Control, Security Vulnerability, Patch, and Configuration Management.

UNIT V Legal and Compliance Issues
Responsibility, ownership of data, right to penetration test, local law where data is held, examination of modern Security Standards (eg.PCIDSS), how standards deal with cloud services and virtualization, compliance for the cloud provider vs. compliance for the customer.

Text Books:

1. Tim Mather, Subra Kumaraswamy, Shahed Latif, Cloud Security and Privacy, O'Reilly.
2. Raghu Yeluri, Enrique Castro-Leon, Building the Infrastructure for Cloud Security A Solutions view, Apress open.
3. Ronald L. Krutz, Russell Dean Vines, Cloud Security A Comprehensive Guide to Secure Cloud Computing, Wiley.

References Books :

1. John Rittinghouse, James Ransome, Cloud Computing, CRC Press.
2. J.R. ("Vic") Winkler, Securing the Cloud, Syngress.
3. Cloud Security Alliance, Security Guidance for Critical Areas of Focus in Cloud Computing.
4. Vmware, VMware Security Hardening Guide, White Paper.
5. Cloud Security Alliance 2010, Top Threats to Cloud Computing, Microsoft.